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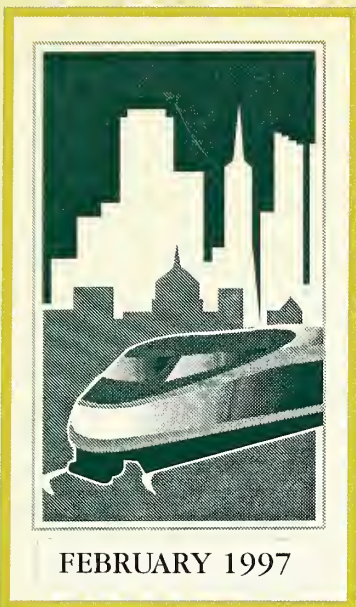
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CALTRAIN SAN FRANCISCO
DOWNTOWN EXTENSION PROJECT
CONCEPTUAL DESIGN AND DRAFT EIS/EIR

Preliminary Operating & Maintenance Cost Estimates

PENINSULA CORRIDOR JOINT POWERS BOARD

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CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION PROJECT

OPERATIONS AND MAINTENANCE COST RESULTS REPORT



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PREPARED FOR
CORRIDOR JOINT POWERS BOARD

PREPARED BY
EL PADRON & ASSOCIATES

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Contents

| | | |
|-----|--|----|
| 1.0 | Introduction | 1 |
| 1.1 | General Model Structure | 1 |
| 2.0 | PCS O&M Cost Models | 3 |
| 2.1 | PCS Diesel O&M Cost Model | 3 |
| 2.2 | PCS Electric O&M Cost Model | 6 |
| 2.3 | PCS Dual Mode O&M Cost Model | 7 |
| 2.4 | PCS Dual Mode With Electric Trailer Cost Model | 7 |
| 3.0 | Subway Station and Tunnel Facility Maintenance | 8 |
| 4.0 | Bus O&M Cost Models | 8 |
| 4.1 | SamTrans O&M Cost Model | 9 |
| 4.2 | MUNI O&M Cost Model | 9 |
| 4.3 | AC Transit O&M Cost Model | 10 |
| 5.0 | O&M Cost Estimates | 10 |
| 5.1 | Description of Alternatives | 10 |
| 5.2 | O&M Cost Model Inputs | 11 |
| 5.3 | PCS O&M Cost Estimates | 11 |
| 5.4 | New Transbay Terminal O&M Cost Estimates | 16 |
| 5.5 | Bus Operator O&M Cost Estimates | 16 |

APPENDICES

| | |
|-----|---|
| 1-1 | No-Build Alternative/Diesel Operation/60 Trains |
| 1-2 | No-Build Alternative/Diesel Operation/86 Trains |
| 2-1 | Transbay Terminal Extension/Dual Mode Operation/60 Trains |
| 2-2 | Transbay Terminal Extension/Dual Mode Operation/86 Trains |
| 3-1 | Transbay Terminal Extension/Dual Mode with Electric Trailer Operation/60 Trains |
| 3-2 | Transbay Terminal Extension/Dual Mode with Electric Trailer Operation/86 Trains |
| 4-1 | Transbay Terminal Extension/Electric Operation/60 Trains |
| 4-2 | Transbay Terminal Extension/Electric Operation/86 Trains |

1.0 INTRODUCTION

For the evaluation of alternatives being considered by the Peninsula Corridor Joint Powers Board (JPB) in the CalTrain San Francisco Downtown Extension Project, results reports have been prepared to document the findings of various technical aspects of the project. This report documents the specific analytic methods and results for the estimation of operating and maintenance (O&M) costs.

In general, the steps of the O&M cost estimating process are:

1. Develop O&M cost models;
2. Calibrate the models for current year operations;
3. Generate operating plans and statistics for each mode;
4. Calculate annual operating and maintenance (O&M) costs.

This report documents the development of O&M cost estimates for the following transit operators: Peninsula Commute Service (PCS), San Mateo County Transit District (SamTrans), San Francisco Municipal Railway (MUNI) and Alameda-Contra Costa Transit District (AC Transit).

The following section of this chapter describes the methodology and general model structure of each O&M cost model. Chapter 2 describes the development of the PCS cost models for diesel operations as well as for the three proposed propulsion options (all-electric, dual mode locomotives and electric trailers). Chapter 3 describes the derivation of the unit cost for maintenance of the proposed Transbay Terminal subway station. The development cost models for SamTrans, MUNI and AC Transit are described in Chapter 4. Finally, the O&M cost results are summarized in Chapter 5.

1.1 GENERAL MODEL STRUCTURE

Each of the O&M cost models are disaggregate, resource build-up models, consistent with the methodology specified by the Federal Transit Administration for major investment studies. The FTA guidelines have strong implications which affect costs and staffing requirements estimated for transit alternatives, especially the stipulation that all costs should be treated as variable (i.e., in the long-term, even modest changes in operations would tend to result in additional overtime pay or higher base wage rates corresponding to increased responsibilities).

The O&M cost models calculate staffing requirements, labor costs and non-labor expenses based on the projected quantity of service supplied and the physical size of the system. Each model was structured in a series of equations that project costs as a function of the quantity of service supplied (e.g., peak vehicles, vehicle miles, vehicle hours). The cost model's input variables determine, directly or indirectly, the estimated costs for all line items in the model.

Labor Cost Formulae

Labor costs are a function of the number of employees in each job classification and the average annual cost per employee. The average cost per employee is based on actual wage and fringe benefit rates paid. The generalized equation for labor costs is of the form:

| | | | | | | |
|-------------------------|---|---------------------------------|---|-------------------------------|---|--------------------------------|
| Annual Labor Cost | = | Value of Driving Variable | x | Labor Productivity Rate | x | Annual Cost Per Employee |
|-------------------------|---|---------------------------------|---|-------------------------------|---|--------------------------------|

where:

Driving Variable Value: The quantity of the input variable which most strongly influences a cost item. For instance, the number of vehicle repair mechanics depends upon the number of train-miles or car-miles operated annually.

Labor Productivity Rate: The number of budgeted positions divided by the value of the driving variable for the calibration (base) level of service. This factor implicitly accounts for local union rules, hiring and training new employees, worker efficiency, and absenteeism.

Annual Cost per Employee: Average annual earnings which includes straight wages or salary, vacation, holiday and sick pay; plus fringe benefits, such as pension funds, social security, and medical insurance.

Non-Labor Cost Formulae

Non-labor costs include expense categories such as materials, utilities, and contract services. These expenses are generally a function of the base year cost and the base and future values of the driving variables. This function assumes that current rates of consumption will continue in future years. Cost equations for non-labor items are generally of the form:

| | | | | | | |
|-----------------------------|---|-----------------------|---|-----------------------------|---|-------------------------------|
| Annual Non-labor Cost | = | Total Base Cost | ÷ | Base Driving Variable | x | Future Driving Variable |
|-----------------------------|---|-----------------------|---|-----------------------------|---|-------------------------------|

where:

Total Base Cost: Actual expense in the base, or calibration, year modeled.

Driving Variables: The quantity of the variable which most strongly influences a cost item.

2.0 PCS COST MODELS

Three propulsion options are being considered for the CalTrain Extension: 1) full system electrification, 2) dual mode operations with new diesel/electric locomotives, and 3) dual mode operation electric trailer units.

Disaggregate and resource build-up cost models have been developed for existing diesel operations and the three propulsion options. Each of the cost models are based on PCS actual operating budget for FY 1995 and existing 60-train service. The models present line item costs within specified powered cost centers (e.g., administration, maintenance of way, maintenance of equipment, train operations, police, JPB costs). Within each cost center, line item costs are defined as follows: labor, material, services, utilities, fuel and miscellaneous costs.

Specific line items have been included for each unique labor position (e.g., engineer, conductor, electronic technician, trackman) and non-labor expense (e.g., track materials, maintenance material, repair services). Each labor and non-labor expense has been modeled as a separate line item, thus ensuring that the equations are mutually exclusive and cover all operating costs. O&M costs are then calculated based on the quantity of service supplied and other system characteristics.

2.1 PCS DIESEL O&M COST MODEL

Input Variables

The model's input variables determine, directly or indirectly, the estimated costs for all line items in the model. Some labor and non-labor cost items are linked to secondary variables, such as the number of employees or total cost. The cost model was calibrated with operating statistics and system characteristics from PCS' FY 1994 Section 15 Report and estimated data for FY 1995. The following variables are used to estimate annual O&M costs for the study alternatives:

- **Annual Passenger Trips:** The number of unlinked passenger trips using the commuter rail system in the forecast year. PCS carried an estimated 5.8 million passengers during FY 1995.
- **Peak Gallery Passenger Cars:** The maximum number of commuter rail vehicles scheduled during the AM or PM peak period. Current 60-train schedules require 67 passenger cars for peak period operations.

- **Fleet Gallery Passenger Cars:** The total number of commuter rail vehicles in the active fleet. In FY 1995, PCS had 73 passenger cars.
- **Peak Trainsets:** The maximum number of locomotives scheduled during the AM or PM peak period. Current 60-train schedules require 15 trainsets in scheduled revenue service.
- **Fleet Locomotives:** The total number of locomotives in the active fleet. In FY 1995, PCS's fleet included 20 locomotives.
- **Annual Train Trips:** The total number of annual scheduled round trips operated by PCS in revenue service in one year. Current train schedules require about 17,700 train trips based on 60 weekday, 24 Saturday and 20 Sunday trips between Tamien and San Francisco and 8 weekday trips to/from Gilroy.
- **Annual Train-Hours:** The total train-hours operated in revenue service, including end-of-line layover time and deadhead time, but excluding report time. In FY 1994, PCS operated about 30,400 train-hours. Using total train-hours rather than revenue train-hours, the model will be sensitive to deadhead operations that differ for the various study alternatives.
- **Annual Train-Miles:** The total train-miles, including deadhead mileage. In FY 1994, PCS operated about 970,900 train-miles.
- **Annual Car-Miles:** The total car-miles, including deadhead mileage. In FY 1994, PCS operated about 3.6 million car-miles.
- **Route-Miles:** The route-miles operated by PCS from San Francisco to Tamien and from Tamien to Gilroy. Current mileage between San Francisco and Tamien is 51.4 miles and between Tamien and Gilroy is 25.4 miles.
- **Total Stations:** The total number of passenger stations in the commuter rail system including terminal stations. Currently, PCS provides service to 34 stations.
- **Terminal Stations:** PCS has terminal stations that provide ticketing and other passenger amenities in San Jose and in downtown San Francisco.
- **Storage and Maintenance Yards:** PCS performs overnight storage and maintenance functions in three yards: Cahill, 4th/Townsend and Gilroy.
- **Park-and-Ride Spaces:** The number of park-and-ride parking spaces in the commuter rail system. Currently, PCS has about 4,400 parking spaces between San Francisco and Tamien and 1,000 parking spaces between Tamien and Gilroy.

Labor Costs

Commuter rail operations are contracted by Amtrak. Labor costs include the average base salary, overtime and salary fringe benefits for each job classification. Base salaries include sick, holiday, vacation and other paid absences, but exclude fringe benefits and overtime wages.

PCS cost centers include: General Administration, Maintenance of Way, Maintenance of Equipment, Train Operations, Train & Yard Movement Control, Revenue Collection, Revenue Accounting, Budgets, Material Control, Police and JPB Costs. In the Train Operations, Maintenance of Way and Maintenance of Equipment cost centers, labor costs for each individual position have been uniquely determined. In all other cost centers, labor costs have been aggregated.

Non-Labor Costs

Non-labor cost items have been classified by cost center and cost type (e.g., materials, maintenance, utilities and insurance). For each non-labor cost item, the cost model identifies the type (e.g., parts and supplies, insurance, utilities, and JPB costs), lookup cost code, driving variable, and unit cost (e.g., track material per route-mile). The following major functions have been assumed to be paid directly by the JPB: public liability and physical damage insurances; adjustments for incentive payments; penalty assessments; extra work; shuttles; timetables and tickets; utilities; fuel; and contracted track maintenance between Lick Junction in South San Jose (end of JPB owned R/W) and Gilroy.

Line Item Listing

The line item listing combines labor and non-labor items and calculates costs and staffing requirements based on the input variables. Costs are shown by cost center and cost type. Expenses are generally a function of the base year cost, and the base and future values of the driving variables. This function implicitly assumes that current rates for consumption will continue in future years. Equations link each item with the operating variable responsible for driving its cost.

The following information is recorded in the model for each line entry:

- Cost item description,
- Cost type (i.e., labor, other, service, material and supplies),
- Lookup codes (refers to labor and non-labor cost tables for unit costs)
- FY 1995 costs,
- Driving variable,
- Number of employees in each staff position,
- Total line item cost, and

- Total department cost.

Summary Tables

Summary tables tabulate cost estimates by cost center and cost type along with the number of employees by cost center.

2.2 PCS ELECTRIC O&M COST MODEL

The full system electrification option envisions electrification of the entire CalTrain alignment from Gilroy to the new downtown terminal, as well as electrification of the planned new maintenance and storage facility in San Jose or Santa Clara and the proposed storage yard in San Francisco. In order to develop electric O&M costs that are consistent with current costs, the diesel O&M cost model has been modified to include specific characteristics of electrification as described below.

Electric operations require new labor positions necessary to maintain the overhead catenary and power distribution system. Additional positions include a Power & Line Supervisor, Power & Line Foremen and Power & Line Maintainers in the Maintenance of Way cost center. Labor productivity rates were based on detailed staffing and budget data from the Bay Area Rapid Transit (BART), adjusted to reflect differences in equipment and facilities that affect operations and maintenance costs (e.g., AC vs. DC power, fewer substations associated with 25kV power distribution system). Electrification of the line from San Francisco to Gilroy will require about thirteen new employees to maintain the overhead catenary and power distribution system. Labor costs for locomotive repair would be about 40% less for electric locomotives compared to diesel locomotives.

Non-labor costs related to electric operations have also been identified. In the Maintenance of Equipment cost center, materials and purchased services unit costs were adjusted to reflect lower equipment maintenance costs associated with electric locomotives. In addition, power & line materials costs were added based on costs for comparable rail operations.

With electrification, diesel fuel costs are replaced with electric traction power costs. Electric traction power costs are based on energy consumption rates derived for electric locomotives (**Feasibility Study for Electrifying the CalTrain/PCS Railroad**, October 1992) and electric power rates for Pacific Gas & Electric (rate schedule E-20). The electric O&M cost model includes a traction power worksheet that calculates customer, energy and demand charges, power adjustment and state surcharge. The projected average power consumption rate (kilowatt-hours per revenue car-mile) and the average power demand rate (kilowatts per peak car) have been input to the traction power worksheet.

The electric O&M cost model has been tested by applying operating statistics from the previous *MTC/JPB CalTrain Downtown Extension and System Upgrades study*. The model shows that with the 60 and 66 train schedules, diesel powered locomotives cost less to operate than electric powered locomotives. However, at the 114 and 156 train schedules, electrified service has lower operating costs than diesel. This suggests that electric powered operations are more expensive than diesel operations at low levels of service, but become more cost-effective at higher service levels. (Based on this and prior studies, it appears that the break even point is about 114 train schedules.)

2.3 PCS DUAL MODE COST MODEL

For the dual mode locomotive option, new locomotives that contain both diesel and electric power capability in one unit would replace the existing diesel fleet. For this option, the diesel engine would provide power for operation over the CalTrain system to approximately 22nd Street in San Francisco, and electric power would be used on the remaining portion into the underground CalTrain terminal. New dual mode locomotives would draw electricity from an overhead catenary system. It is assumed that the CalTrain Extension would initially be powered using a 1,500-Volt DC overhead power distribution system and that substations would be compatible with available off-the-shelf dual mode locomotives.

The dual-mode model was also derived from the PCS diesel cost model, with adjustments made to reflect replacement of PCS' fleet of diesel locomotives with diesel/electric dual-mode locomotives (e.g., GE Genesis II used by Amtrak and Metro North in New York City). Selected line costs in the vehicle maintenance cost center were increased by a factor of 1.2 to reflect slightly higher locomotive repair labor and materials costs. In addition, fuel costs were estimated only for the line segment between Gilroy and the transition to electric power operations (about 3.0 miles from the Transbay Terminal) and electric power costs were estimated for the remaining 3.0 mile segment.

2.4 PCS DUAL MODE WITH ELECTRIC TRAILER COST MODEL

For the dual mode with electric trailer propulsion option, diesel locomotives similar to those presently used would power CalTrain from Gilroy to approximately 22nd Street in San Francisco. The propulsion system would then convert to electric mode without stopping prior to entering the underground alignment. To prevent release of diesel exhaust pollutants in the tunnel or underground terminal, an electric power convertor unit, coupled to the diesel locomotive, would provide power for the underground operation in the downtown terminal.

The dual mode with electric trailer cost model featured adjustments for additional vehicle maintenance of the power trailers (roughly equal to an electric locomotive), increased diesel fuel costs for the Gilroy to electric transition segment (due to additional weight of

the power trailer), electric power costs for the 3.0 mile electric power segment, and maintenance of power distribution facilities for the 3.0 mile segment.

3.0 SUBWAY STATION AND TUNNEL FACILITY MAINTENANCE

For the Transbay Terminal Extension alternatives, O&M costs were estimated for maintenance of the new terminal and tunnel. The proposed new CalTrain terminal would encompass the footprint of the present Transbay Terminal building plus 13 feet of Natoma Street and eight feet of Minna Street. Six tracks and three center platforms, each 850 feet long and 28 feet wide, would serve CalTrain, with two tracks available for future intercity and/or high speed rail service.

Subway station and tunnel facility maintenance costs were researched for Bay Area Rapid Transit (BART) subway stations in downtown San Francisco. The BART stations in downtown San Francisco have three levels -- a mezzanine, MUNI platform with two tracks, and BART platform also with two tracks. BART stations are about 700 feet long. A detailed, resource build-up O&M cost model was recently developed for BART by Manuel Padron & Associates (**BART O&M Cost Model User Manual**, May, 1994). The model includes station related labor and non-labor expenses in the following BART cost centers: 1) Operations Administration & Facilities Management, 2) Communications & Component Repair (AFC Maintenance, Communications Maintenance), 3) Power & Way Maintenance (Power & Mechanical, Track & Structures), and 4) Transportation (Station Appearance, Station Operations).

The BART model calculated an incremental staffing requirement of 11.0 employees and \$895,000 (1993 dollars) for an average subway station. Given the larger dimensions of the proposed PCS terminal, the station and tunnel facility maintenance is estimated to be about 50% more than the average BART subway station, or about \$1.45 million (1995 dollars).

4.0 BUS O&M COST MODELS

O&M cost models were developed for the following transit operators which would be affected by the Transbay Terminal Extension: San Mateo County Transit District (SamTrans); San Francisco Municipal Railway (MUNI); and Alameda-Contra Costa Transit District (AC Transit). Each cost model was developed based on recent FY 1994 Section 15 Reports.

Labor and non-labor costs were reported by the following Section 15 object classes: operator wages and salaries, other wages and salaries, fringe benefits, services, materials and supplies, utilities, casualty and liability, purchased transportation, miscellaneous expenses, expenses transfer, leases and rentals. Labor and non-labor costs were reported by mode (e.g., motor bus) and function (vehicle operations, vehicle maintenance, non-vehicle maintenance and general administration).

4.1 SAMTRANS O&M COST MODEL

The SamTrans model estimates O&M costs for motor bus and demand response operations. The cost model was calibrated with FY 1994 operating statistics and system characteristics from SamTrans' FY 1994 Section 15 report. The following variables are input to the model:

- **Revenue Vehicle-Miles:** The total vehicle-miles operated in revenue service, excluding deadhead mileage. For FY 1994, SamTrans operated 7.9 million revenue motor bus-miles.
- **Revenue Vehicle-Hours:** The total bus-hours operated in revenue service, excluding report and deadhead time. For 1994, SamTrans operated about 690,000 revenue motor bus-hours and 68,000 revenue demand response-hours.
- **Peak Period Vehicles:** The maximum number of motor buses directly operated by SamTrans during the A.M. or P.M. peak periods. In 1994, 251 motor buses were required for peak period operations.

4.2 MUNI O&M COST MODEL

The MUNI model estimates annual costs for motor bus, demand response, light rail, trolley bus and cable car operations. The cost model was calibrated with FY 1994 operating statistics and system characteristics from MUNI's FY 1994 Section 15 report. The model uses the following variables:

- **Revenue Vehicle-Miles:** The total vehicle-miles operated by MUNI in revenue service, excluding deadhead mileage. During FY 1994, MUNI operated 12.6 million motor bus, 3.6 million light rail, 7.1 million trolley bus, and 0.5 million cable car revenue vehicle-miles.
- **Revenue Vehicle-Hours:** The total bus-hours, train-hours or cable car-hours operated in revenue service, excluding report and deadhead time. For 1994, MUNI operated 1.37 million revenue bus-hours, 0.10 million revenue demand response-hours, 0.34 million light rail revenue vehicle-hours, 0.99 million revenue trolley bus-hours and 0.13 million revenue cable car-hours .
- **Peak Period Vehicles:** The maximum number of motor buses directly operated by MUNI during the A.M. or P.M. peak periods. In 1994, 379 motor buses, 99 light rail vehicles, 264 trolley buses and 26 cable car vehicles were required for peak period operations.

4.3 AC TRANSIT O&M COST MODEL

The AC Transit model estimates O&M costs for motor bus operations. The cost model was calibrated with FY 1994 operating statistics and system characteristics from AC Transit's FY 1994 Section 15 report. The following variables are used to estimate costs:

- **Revenue Vehicle-Miles:** The total motor bus-miles operated by AC Transit in revenue service, excluding deadhead mileage. During FY 1994, AC Transit operated 22.9 million motor bus revenue bus-miles.
- **Revenue Vehicle-Hours:** The total bus-hours or train-hour operated in revenue service, excluding report and deadhead time. For 1994, AC Transit operated about 1.83 million revenue motor bus-hours.
- **Peak Period Vehicles:** The maximum number of motor buses directly operated by AC Transit during the A.M. or P.M. peak periods. In 1994, 583 motor buses were required for peak period operations.

5.0 O&M COST ESTIMATES

The O&M cost models described in the above sections and in the *Final O&M Cost Model Methodology Report* were used to estimate O&M costs for the CalTrain San Francisco Downtown Extension Project.

5.1 DESCRIPTION OF ALTERNATIVES

Two alternatives have been identified by the Joint Powers Board (JPB) to be carried forward in the Draft Environmental Impact Statement (DEIS)/Draft Environmental Impact Report (DEIR) for the CalTrain San Francisco Downtown Extension (DTX) Project. The two alternatives are the No Build Alternative and the Transbay Terminal Site Alternative. Following are brief descriptions of the alternatives.

The No Build Alternative represents the existing and committed (funded) transportation services and facilities in the Project Area. The No Build Alternative includes existing CalTrain service and funded improvements; related bus, rail and roadway improvements in the Project Area; and a BART extension to San Francisco International Airport.

The Transbay Terminal Site Alternative represents the "build" scenario for extending CalTrain from its current terminus at Fourth and Townsend Streets to downtown San Francisco. The build alternative includes all the elements described in the No Build Alternative except for those transportation services or facilities that would be replaced or discontinued as a result of construction and implementation of the Transbay Terminal Site Alternative. In addition, this alternative includes the underground rail extension and new terminal facility at the site of the existing Transbay Terminal in downtown

San Francisco, the propulsion system for operating CalTrain in subway and along the length of the alignment, expanded park-and-ride lots at 15 station locations, and a new CalTrain storage yard. An underground CalTrain terminal would require demolition of the existing Transbay Terminal. Replacement of this bus facility would be a project mitigation. The existing CalTrain terminal and track at Fourth and Townsend would be removed.

Each alternative has been tested using 60 and 86 train schedules. Operating characteristics were calculated for each alternative, equilibrating level of service with ridership projections.

5.2 O&M COST MODEL INPUTS

The system characteristics and operating statistics used to drive the commuter rail cost models are presented in Table 1. These statistics are total CalTrain system statistics, regardless of propulsion option (diesel, electric, dual mode or dual mode electric trailer). Model inputs for the bus cost models, presented in Table 2, are increments to existing service levels.

5.3 PCS O&M COST ESTIMATES

Cost estimates for PCS operations were developed for the three propulsion options (all-electric, dual-mode and dual mode electric trailer) and two train service levels (60 and 86 weekday trains). Estimated PCS O&M costs are summarized in Table 3.

No-Build Alternative

Cost estimates for the No-Build Alternative 60 and 86 train schedules were based on the PCS diesel mode cost model. CalTrain costs for the 60 and 86 train schedules are \$48.90 and \$60.63 million, respectively. MUNI, SamTrans and AC Transit motor bus operations would not be affected by the No-Build Alternative. Detailed O&M cost estimates for the No Build Alternative are presented in Appendices 1-1 and 1-2.

Transbay Terminal Extension

Cost estimates for the Transbay Terminal Extension 60 and 86 train schedules used the cost models developed for the three propulsion modes described in Chapter 2. Operating requirements were estimated for each service level based on the design characteristics and projected ridership for the alternative. The Transbay Terminal Extension requires additional staffing and higher O&M costs than the No-Build Alternative for the following reasons:

CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION PROJECT
TABLE 1. COMMUTER RAIL O&M COST MODEL INPUTS

| COMMUTER RAIL SYSTEM CHARACTERISTIC | NO-BUILD | | EXTENSION TO TRANSBAY TERMINAL | | | | | |
|--|-----------|-----------|--------------------------------|------------------------|-------------------------------|------------|-----------------------------|------------|
| | 60 Train | 86 Trains | 60 Trains | Dual-Mode 86 Trains | Electric Trailer 60 Trains | 86 Trains | Fully Electric 60 Trains | 86 Trains |
| Annual Passengers | 8,229,000 | 8,966,000 | 11,217,000 | 12,065,000 | 11,217,000 | 12,065,000 | 11,217,000 | 12,065,000 |
| Peak Gallery Passenger Cars | 82 | 82 | 95 | 95 | 95 | 95 | 95 | 95 |
| Fleet Gallery Passenger Cars | 90 | 90 | 110 | 110 | 110 | 110 | 110 | 110 |
| Peak Trainsets in Rev. Service | 15 | 17 | 15 | 17 | 15 | 17 | 15 | 17 |
| Fleet Locomotives | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 |
| Annual Train Trips | 17,778 | 24,932 | 17,778 | 24,932 | 17,778 | 24,932 | 17,778 | 24,932 |
| Total Annual Train-Hours | 27,800 | 38,990 | 28,800 | 39,990 | 28,800 | 39,990 | 28,800 | 39,990 |
| Total Annual Train-Miles | 938,400 | 1,316,000 | 970,500 | 1,357,700 | 970,500 | 1,357,700 | 970,500 | 1,357,700 |
| Total Annual Car-Miles | 4,429,000 | 6,211,000 | 5,311,000 | 7,429,000 | 5,311,000 | 7,429,000 | 5,311,000 | 7,429,000 |
| Route-Miles: SF to Tamien | 51.4 | 51.4 | 52.7 | 52.7 | 52.7 | 52.7 | 52.7 | 52.7 |
| Route-Miles: Tamien to Gilroy | 25.4 | 25.4 | 25.4 | 25.4 | 25.4 | 25.4 | 25.4 | 25.4 |
| Total Stations | 34 | 34 | 35 | 35 | 35 | 35 | 35 | 35 |
| Terminal Stations | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Storage & Maintenance Yards | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Park-and-Ride Spaces | 6,630 | 6,970 | 8,830 | 9,170 | 8,830 | 9,170 | 8,830 | 9,170 |

NOTES:

- (1) Annual Passengers based on weekday boardings x 278 annual factor ("Ridership Forecasting Results Report", April 9, 1996).
- (2) Additional 17 passenger cars will be acquired for No-Build and 37 (17 + 20) cars for Build alternatives. Peak cars adjusted to match projected ridership.
- (3) Two additional trainsets will be required for the 86-train schedule.
- (4) Weekday 86 train schedule assumed to also increase Saturday service from 26 to 32 trips and Sunday service from 20 to 24 trips.
- (5) Operating requirements for Build alternatives include deadhead to 16th St. yard for midday storage (assume 8 deadhead trains/peak period).
- (6) Existing route-miles + 1.30 miles from 4th/Townsend to Transbay Terminal (Build alternatives).
- (7) Total stations include Gilroy extension and Mission Bay station (Build alternatives). San Jose Dindon and San Francisco are terminal stations.
- (8) San Jose (heavy maintenance & overnight storage), San Francisco (light maintenance and midday storage), and Gilroy (storage only).
- (9) 2,200 additional P-R spaces projected for Build alternatives (memo from Dave Minister to John Mason, August 26, 1996).

Prepared by Manuel Padron & Associates

12-Sep-96

CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION PROJECT
TABLE 2. BUS O&M COST MODEL INPUTS (ANNUAL VALUES)

| Transit Operator | Option A - Main-Beale Terminal | | Option B - Transbay Terminal Site Short Medium | | Option C - Main-Beale Surface Ramp Access | Option C - Main-Beale Surface Street Access | Option D - Transbay Terminal Surface | |
|--|--------------------------------|--------------|---|--------------|---|---|--------------------------------------|-----------|
| SamTrans | | | | | | | | |
| <u>Eliminate SF Routes</u> | | | | | | | | |
| Peak Buses | -32 | -32 | -32 | -32 | -32 | -32 | -32 | (1) |
| Rev. Veh-Miles | (405,194) | (405,194) | (405,194) | (405,194) | (405,194) | (405,194) | (405,194) | (1) |
| Rev. Veh-Hours | (16,515) | (16,515) | (16,515) | (16,515) | (16,515) | (16,515) | (16,515) | (1) |
| <u>Downtown Bus Operations</u> | Pass Through | M/B Mall | Pass Through | Pass Through | Pass Through | Pass Through | Pass Through | |
| Peak Buses | 0 | 0 | 0 | 0 | 0 | 0 | 0 | (3) |
| Rev. Veh-Miles | (1,900) | 4,500 | (1,900) | (1,900) | (1,900) | (1,900) | (1,900) | (3) |
| Rev. Veh-Hours | (2,100) | 2,200 | (2,100) | (2,100) | (2,100) | (2,100) | (2,100) | (3) |
| MUNI | | | | | | | | |
| <u>Re-route Lines 30, 42, 76, and 82X/Eliminate Shuttle Routes 80X & 81X</u> | | | | | | | | |
| Peak Buses | -4 | -4 | -4 | -4 | -4 | -4 | -4 | (2) |
| Rev. Veh-Miles | (151,050) | (151,050) | (151,050) | (151,050) | (151,050) | (151,050) | (151,050) | (2) |
| Rev. Veh-Hours | (15,732) | (15,732) | (15,732) | (15,732) | (15,732) | (15,732) | (15,732) | (2) |
| <u>Downtown Bus Operations</u> | Pass Through | M/B Mall | Pass Through | Pass Through | Pass Through | Pass Through | Pass Through | |
| Peak Buses | 0 | 0 | 0 | 0 | 0 | 0 | 0 | (3) |
| Rev. Veh-Miles | 33,600 | 102,000 | 33,600 | 33,600 | 45,100 | 45,100 | 33,600 | (3) |
| Rev. Veh-Hours | (1,200) | 6,400 | (1,200) | (1,200) | (400) | (400) | (1,200) | (3) |
| AC Transit | | | | | | | | |
| <u>Downtown Bus Operations</u> | | | | | | | | |
| Peak Buses | 0 | 0 | 0 | 0 | 0 | 6 | 3 | (3,5,6,7) |
| Rev. Veh-Miles | 11,000 | 11,000 | (13,700) | 1,000 | (2,900) | 4,500 | (10,770) | (3,5,6,7) |
| Rev. Veh-Hours | 400 | 400 | 400 | 2,400 | 7,200 | 12,600 | 7,700 | (3,5,6,7) |
| <u>Deadhead (Permanent)</u> | | | | | | | | |
| <u>Storage-Location</u> | Ramps | Ramps | Ramps | Ramps | Mission Bay | Mission Bay | Mission Bay | |
| Peak Buses | 0 | 0 | 0 | 0 | 0 | 0 | 0 | (3) |
| Rev. Veh-Miles | 0 | 0 | 0 | 0 | 99,960 | 99,960 | 99,960 | (3) |
| Rev. Veh-Hours | 0 | 0 | 0 | 0 | 8,330 | 8,330 | 8,330 | (3) |
| <u>Deadhead (Construction)</u> | | | | | | | | |
| <u>Storage-Location</u> | Folsom/Beale | Folsom/Beale | Folsom/Beale | Folsom/Beale | Folsom/Beale | Folsom/Beale | Folsom/Beale | |
| Peak Buses | 0 | 0 | 0 | 0 | 0 | 0 | 0 | (4) |
| Rev. Veh-Miles | 30,000 | 30,000 | 12,400 | 12,400 | 30,000 | 30,000 | 12,400 | (4) |
| Rev. Veh-Hours | 3,000 | 3,000 | 1,250 | 1,250 | 3,000 | 3,000 | 1,250 | (4) |

NOTES:

- (1) Memo from Carolyn Gonot to John Mason (May 17, 1996).
- (2) Memo from Carolyn Gonot to John Mason (May 7, 1996).
- (3) Draft CalTrain San Francisco Downtown Extension DEIS/DEIR, Table 6.3-1, Aug. 2, 1996.
- (4) Memo from Carolyn Gonot to John Mason (June 28, 1996).
- (5) Memo from Linda Rhine to John Mason (October 24, 1996).
- (6) Memo from Linda Rhine to Darrell Vice re: Proposed Variant for Bus Terminal Replacement Option C, (December 9, 1996).
- (7) Memo from Linda Rhine to David Minister (January 7, 1997).

Prepared by Manuel Padron & Associates.

16-Jan-97

CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION PROJECT
TABLE 3. COMMUTER RAIL O&M COST ESTIMATES

| COMMUTER RAIL O&M COST ESTIMATE | NO-BUILD | | EXTENSION TO TRANSBAY TERMINAL | | | |
|------------------------------------|--------------|------------|--------------------------------|--------------|------------------|--------------|
| | 60 Trains | 86 Trains | Dual-Mode | | Electric Trailer | |
| | | | 60 Trains | 86 Trains | 60 Trains | 86 Trains |
| Annual O&M Cost | \$48,901,000 | 60,630,000 | \$55,668,000 | \$68,603,000 | \$57,584,000 | \$70,992,000 |
| Incremental O&M Cost | NA | NA | \$ 6,767,000 | \$7,973,000 | \$ 8,683,000 | \$10,362,000 |
| Annual Cost/Pass. Trip | \$5.94 | \$6.76 | \$4.96 | \$5.69 | \$5.13 | \$5.88 |
| Annual Cost/Train-Hour | \$1,759 | \$1,555 | \$1,933 | \$1,716 | \$1,999 | \$1,775 |
| Annual Cost/Car-Mile | \$11.04 | \$9.76 | \$10.48 | \$9.23 | \$10.84 | \$9.56 |
| | | | | | \$4.96 | \$5.61 |
| | | | | | \$1,931 | \$1,693 |
| | | | | | \$10.47 | \$9.1 |

NOTES:

- (1) Costs estimated in 1995 dollars.
(2) Cost summary tables presented in Appendices 1-1, 1-2, 2-1, 2-2, 3-1, 3-2, 4-1 and 4-2.

Prepared by Manuel Padron & Associates

13-Sep-96

- Increased ridership (35 percent more passenger trips than the No-Build) projected for the Transbay Terminal Extension requires more passenger cars to provide sufficient seat capacity. Since the service levels are comparable to the No-Build (60 and 86 trains), the average peak period train consist will increase from 4.8 cars for the No-Build Alternative to 5.6 cars for the Transbay Terminal Extension (86 train schedule). Total annual car-miles will increase similarly. The longer trains also require additional Conductor and Assistant Conductor positions.
- The 86 train service level (most trips are added in the midday) results in higher usage of the passenger car fleet (e.g., annual miles per car). As a result, a higher maintenance spare ratio (15 percent) has been assumed for the 86 train service level. Each fleet passenger car would operate about 48,000 annual miles for the 60 train service level, increasing to almost 68,000 annual miles for the 86 train service level. The locomotive spare ratio is adequate for both the 60 and 86 service levels, despite increased annual miles per locomotive.
- The additional mileage to the Transbay Terminal (1.3 miles) produces more annual train-miles and car-miles for the same service levels. These higher operating requirements result in higher equipment maintenance costs and fuel/power costs.
- The Transbay Terminal Extension will require additional deadheading to the proposed 16th Street yard. Operations analyses have estimated the one-way deadhead time to be about 15 minutes, including 5 minutes of run time to/from the yard and 10 minutes in the yard. This deadheading will result in additional train crews (Engineers, Conductors and Assistant Conductors) and corresponding higher labor costs.
- Unique operating characteristics of the three proposed propulsion modes (fully electric, dual mode and dual mode with electric trailers) will affect annual O&M costs. Compared to current operations, each of the propulsion options will require additional Maintenance of Way costs associated with maintenance of the traction power system. The dual mode and dual mode with electric trailer options will also have higher equipment maintenance and fuel/power costs than either diesel or fully electric operations.

In addition, the Transbay Terminal Extension will allow the reduction of MUNI shuttle buses serving the 4th/Townsend Depot. As a result, annual JPB Shuttle Bus costs will decrease by about \$370,000 (amount paid to MUNI in FY 1995/96 budget).

Annual O&M costs for the Transbay Terminal Extension 60 train schedule are \$55.67 million for dual-mode, \$55.62 million for fully-electric and \$57.58 for dual mode electric trailer options. With the 86 train schedule, costs are \$68.60 million for dual mode, \$67.69 million for fully-electric and \$70.99 for dual mode electric trailer options. Table 3 summarizes the estimated annual PCS costs for the two service levels and three propulsion options and shows the incremental cost of the Transbay Terminal Extension alternatives relative to the No-Build Alternative. Detailed cost summary tables are presented in Appendices 2-1 and 2-2 for the dual mode option, Appendices 3-1 and 3-2 for the dual mode with electric trailer option, and Appendices 4-1 and 4-2 for the fully-electric option.

5.4 NEW TRANSBAY TERMINAL O&M COST ESTIMATES

For the Transbay Terminal Extension an additional cost of \$1.45 million (1995 dollars) has been estimated to account for terminal and tunnel facility maintenance costs. This is the incremental O&M cost required to operate and maintain the underground CalTrain platform and ground/street level mezzanine. The incremental station cost does not include costs necessary to operate and maintain that portion of the facility used for motor bus operations (refer to Transbay Area Plan Project).

5.5 BUS OPERATOR O&M COST ESTIMATES

The CalTrain Downtown Extension project will impact operation of connecting transit services in two ways: first, extending CalTrain service downtown will reduce the need for express bus service from the Peninsula to downtown San Francisco and will eliminate the need for shuttle service from CalTrain's existing terminal at Fourth and Townsend Streets to downtown; and, second, replacement of the Transbay Terminal will affect surface transit operators using the existing transit facility.

The CalTrain Downtown Extension project will require that the existing Transbay Terminal be demolished to enable construction of the new CalTrain terminal underground. As part of the CalTrain Downtown Extension project's environmental analysis, the following four options were evaluated for replacement of the Transbay Terminal functions:

- Option A: Main-Beale Site (Terminal Building);
- Option B: Transbay Terminal Site - over CalTrain Terminal (Terminal Building);
- Option C: Main-Beale Site (Surface Bus Facility); and
- Option D: Transbay Terminal Site - over CalTrain Terminal (Surface Bus Facility).

Additionally, Options B and C contain two sub-options each; Option B includes "short" and "medium" terminal sub options; Option C includes direct bus access from an I-80 freeway ramp and bus access via surface streets to the site.

Each of the options and sub-options have different impacts on the operation of the surface transit operators. Table 2 summarizes the incremental operating requirements (i.e. peak buses, annual bus miles and annual bus hours) relative to existing operations for each operator. Table 4 summarizes the O&M cost estimates for each operator. These service changes and resultant O&M cost estimates are described below.

SamTrans

The extension of CalTrain would decrease the need for SamTrans express bus service from the Peninsula to the Transbay Terminal. SamTrans express routes 1F, 16F, 17F, 18F, 19F and 41F would be eliminated. This reduction in service would decrease the number of SamTrans peak buses by 32, annual revenue bus-hours by 16,500, and annual revenue bus-miles by 405,000. This would result in a \$2.6 million (1995 dollars) reduction in annual O&M costs for SamTrans.

Two options were evaluated for future SamTrans service to the Transbay Terminal replacement facility: the Beale-Fremont Pass-Through and the Main-Beale Mall. The Beale-Fremont Pass-Through would reduce annual SamTrans operating costs by \$85,000 while the Main-Beale Mall would increase costs by \$92,000. The Pass-Through was included in Options A, B, C, and D while the Main-Beale Mall was included in Option A, although other combinations are possible.

MUNI

The extension of CalTrain would result in rerouting of several MUNI bus lines that currently serve CalTrain's Fourth and Townsend Streets terminal, elimination of MUNI shuttle bus service from the existing CalTrain terminal to downtown San Francisco, and a possible reduction in MUNI Metro light rail service to the existing CalTrain terminal (to begin operation in Summer 1997).

The MUNI plans to make the following changes to routes serving the existing CalTrain terminal following the extension project:

- The 30-Stockton would be truncated and rerouted along Mission Street.
- The 42-Downtown Loop would be rerouted to run along Harrison Street and Bryant Street between Fifth Street and Main Street.
- The 76-Marin Headlands and the 82X-Levi Plaza Express would be truncated and rerouted to serve the Transbay Terminal area.

The above changes are predicted to result in the reduction of four peak buses, 15,700 bus-hours, and 151,000 bus-miles. MUNI's annual O&M costs would be reduced by about \$1.39 million (1995 dollars). These cost savings include the estimated \$370,000

reduction in PCS Shuttle costs which are paid by the JPB to MUNI for bus service to the 4th/Townsend Depot.

The same two options were evaluated for future MUNI service to the Transbay Terminal replacement facility as for SamTrans service: the Beale-Fremont Pass-Through and the Main-Beale Mall. The Beale-Fremont Pass-Through would increase annual MUNI operating costs by \$56,000 while the Main-Beale Mall would increase costs by \$596,000. The Pass-Through was included in Options A, B, C, and D while the Main-Beale Mall was included in Option A, although other combinations are possible.

Finally, MUNI plans to extend Metro service from the Embarcadero Station to 4th/King Street, adjacent to the CalTrain Depot, in early 1998. Current plans call for extending the J and M lines to 4th/King during peak periods and just the J line during off-peak periods. Following the extension of CalTrain to the Transbay Terminal, MUNI could reduce Metro service to Fourth and King Streets, since CalTrain passengers would no longer be transferring to MUNI Metro at this station. This would result in additional O&M cost savings to MUNI; however, these additional cost savings have not been included in this analysis.

AC Transit

AC Transit is currently the largest user of the Transbay Terminal and its bus access ramps. AC Transit uses the facility as its downtown San Francisco express bus terminal, uses the access ramps to keep its buses out of surface street congestion, and stores buses on the ramps during the midday. Demolition of the terminal and access ramps will affect AC Transit's O&M costs under both revenue and deadhead operations. Since virtually all AC Transit Transbay routes require long shifts for bus operators, the AC Transit cost model was adjusted to reflect an increment for bus operator overtime wages and fringe benefits.

As shown on Table 4, AC Transit's operating cost increases vary significantly depending on the particular bus terminal option evaluated. The increases range from a low of \$6,000 annually (Option B: Transbay Terminal Short) to a high of \$1,216,000 annually (Option C: Main-Beale Surface with Surface Street Access).

There are two deadhead costs shown in Table 4, the deadhead during construction of the replacement bus terminal and the permanent deadhead costs. The permanent deadhead construction cost increase ranges from a low of \$0 for options that include bus storage on bus ramps to the new terminals (Options A and B) to \$692,000 annually for the surface bus facility options which assume midday storage would be provided at a site in the Mission Bay area (Options C and D).

CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION PROJECT
TABLE 4. BUS O&M COST ESTIMATES (ANNUAL VALUES)

| Transit Operator | Option A Main-Beale Terminal | | Option B Transbay Terminal | | Option C Main-Beale Surface | | Option D Transbay Term'l Surface |
|--|---------------------------------|---------------|-------------------------------|---------------|--------------------------------|--------------------|--|
| | | | Short | Medium | Ramp Access | Surface St. Access | |
| SamTrans Eliminate SF Routes | (\$2,608,000) | (\$2,608,000) | (\$2,608,000) | (\$2,608,000) | (\$2,608,000) | (\$2,608,000) | (\$2,608,000) |
| Downtown Bus Operations | (\$85,000) | \$92,000 | (\$85,000) | (\$85,000) | (\$85,000) | (\$85,000) | (\$85,000) |
| Bus Access to Terminal | Pass Through | M/B Mall | Pass Through | Pass Through | Pass Through | Pass Through | Pass Through |
| MUNI Eliminate Shuttle Routes/Re-Routing | (\$1,386,000) | (\$1,386,000) | (\$1,386,000) | (\$1,386,000) | (\$1,386,000) | (\$1,386,000) | (\$1,386,000) |
| Downtown Bus Operations | \$56,000 | \$596,000 | \$56,000 | \$596,000 | \$56,000 | \$56,000 | \$56,000 |
| Bus Access to Terminal | Pass Through | M/B Mall | Pass Through | Pass Through | Pass Through | Pass Through | Pass Through |
| AC Transit Downtown Bus Operations | \$42,000 | \$42,000 | \$6,000 | \$158,000 | \$510,000 | \$867,000 | \$517,000 |
| Deadhead (Permanent) | \$0 | \$0 | \$0 | \$0 | \$692,000 | \$692,000 | \$692,000 |
| Deadhead (Construction) | \$240,000 | \$240,000 | \$100,000 | \$100,000 | \$240,000 | \$240,000 | \$100,000 |

NOTES:

(1) Costs estimated in 1995 dollars.

Prepared by Manuel Padron & Associates

16-Jan-97

The construction deadhead costs range from a low of \$100,000 annually (for options that include a new AC Transit terminal at the site of the existing terminal) to \$240,000 annually (for options that include AC Transit at the Main-Beale site). This difference in cost is due to the fact that under construction of a new terminal at the existing Transbay Terminal site (either Option B, a building, or Option D, a surface facility), a temporary surface AC Transit passenger terminal would need to be located at the Main-Beale site; since this site is located directly across the street from the proposed temporary midday storage site (Folsom/Beale), AC's Transbay bus deadhead costs would be minimized.

APPENDICES

CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION PROJECT
APPENDIX 1-1. NO BUILD ALTERNATIVE/DIESEL OPERATIONS/60 TRAINS

SUMMARY OF COSTS BY DEPARTMENT AND COST TYPE

| DEPARTMENT | | LABOR | MATL | SERV | OTHER | TOTAL COST |
|---------------------------------|------|---------------------|--------------------|--------------------|---------------------|---------------------|
| <u>Amtrak Costs</u> | | | | | | |
| General & Administrative | 100 | \$509,051 | \$0 | \$0 | \$703,944 | \$1,212,995 |
| Maintenance of Way | 200 | \$2,207,019 | \$626,290 | \$174,400 | \$770,109 | \$3,777,818 |
| Maintenance of Equipment | 300 | \$4,931,560 | \$1,540,101 | \$325,097 | \$198,191 | \$6,994,949 |
| Train and Yard Operations | 400 | \$8,427,619 | \$0 | \$0 | \$78,023 | \$8,505,642 |
| Train and Yard Movement Control | 500 | \$905,038 | \$0 | \$0 | \$51,490 | \$956,528 |
| Revenue Collection | 600 | \$1,068,799 | \$0 | \$267,916 | \$82,500 | \$1,419,215 |
| Revenue Accounting | 700 | \$318,254 | \$0 | \$0 | \$21,975 | \$340,229 |
| Budgets | 800 | \$128,832 | \$0 | \$0 | \$14,800 | \$143,632 |
| Materials Control | 900 | \$209,999 | \$0 | \$0 | \$62,702 | \$272,701 |
| Police | 1000 | \$771,095 | \$0 | \$0 | \$110,755 | \$881,850 |
| Amtrak General Overhead | 1100 | \$0 | \$0 | \$0 | \$1,396,817 | \$1,396,817 |
| Amtrak Management Fee | 1200 | \$0 | \$0 | \$0 | \$1,476,435 | \$1,476,435 |
| <u>JPB Costs</u> | | | | | | |
| Insurance | 1300 | \$0 | \$0 | \$0 | \$4,667,723 | \$4,667,723 |
| Fuel | 1310 | \$0 | \$2,739,191 | \$0 | \$0 | \$2,739,191 |
| Shuttles | 1320 | \$0 | \$0 | \$0 | \$4,952,155 | \$4,952,155 |
| Timetables & Tickets | 1330 | \$0 | \$510,766 | \$0 | \$0 | \$510,766 |
| Utilities | 1340 | \$0 | \$0 | \$0 | \$447,200 | \$447,200 |
| Incentive Payments | 1350 | \$0 | \$0 | \$0 | \$1,816,702 | \$1,816,702 |
| Other Contract Amtrak | 1360 | \$0 | \$0 | \$0 | \$2,024,646 | \$2,024,646 |
| Recollectible Recoveries | 1370 | \$0 | \$0 | \$0 | (\$1,662,839) | (\$1,662,839) |
| Gilroy Trackage | 1380 | \$0 | \$0 | \$447,000 | \$0 | \$447,000 |
| G&A/Support | 1390 | \$4,271,231 | \$0 | \$489,437 | \$819,174 | \$5,579,842 |
| Total Cost = | | \$23,748,497 | \$5,416,348 | \$1,703,850 | \$18,032,503 | \$48,901,198 |

Costs estimated in 1995 dollars.

Prepared by Manuel Padron & Associates

12-Sep-96

CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION PROJECT
APPENDIX 1-2. NO BUILD ALTERNATIVE/DIESEL OPERATIONS/86 TRAINS

SUMMARY OF COSTS BY DEPARTMENT AND COST TYPE

| DEPARTMENT | | LABOR | MATL | SERV | OTHER | TOTAL COST |
|---------------------------------|------|---------------------|--------------------|--------------------|---------------------|---------------------|
| <u>Amtrak Costs</u> | | | | | | |
| General & Administrative | 100 | \$727,216 | \$0 | \$0 | \$904,304 | \$1,631,520 |
| Maintenance of Way | 200 | \$2,207,019 | \$626,290 | \$174,400 | \$770,109 | \$3,777,818 |
| Maintenance of Equipment | 300 | \$6,510,920 | \$1,893,996 | \$340,265 | \$258,061 | \$9,003,243 |
| Train and Yard Operations | 400 | \$11,788,074 | \$0 | \$0 | \$109,232 | \$11,897,306 |
| Train and Yard Movement Control | 500 | \$1,292,911 | \$0 | \$0 | \$73,557 | \$1,366,469 |
| Revenue Collection | 600 | \$1,068,799 | \$0 | \$267,916 | \$82,500 | \$1,419,215 |
| Revenue Accounting | 700 | \$318,254 | \$0 | \$0 | \$21,875 | \$340,229 |
| Budgets | 800 | \$193,248 | \$0 | \$0 | \$22,200 | \$215,448 |
| Materials Control | 900 | \$209,999 | \$0 | \$0 | \$62,702 | \$272,701 |
| Police | 1000 | \$1,092,385 | \$0 | \$0 | \$156,903 | \$1,249,288 |
| Amtrak General Overhead | 1100 | \$0 | \$0 | \$0 | \$1,776,874 | \$1,776,874 |
| Amtrak Management Fee | 1200 | \$0 | \$0 | \$0 | \$1,878,156 | \$1,878,156 |
| <u>JPB Costs</u> | | | | | | |
| Insurance | 1300 | \$0 | \$0 | \$0 | \$5,691,612 | \$5,691,612 |
| Fuel | 1310 | \$0 | \$3,841,300 | \$0 | \$0 | \$3,841,300 |
| Shuttles | 1320 | \$0 | \$0 | \$0 | \$5,395,677 | \$5,395,677 |
| Timetables & Tickets | 1330 | \$0 | \$556,510 | \$0 | \$0 | \$556,510 |
| Utilities | 1340 | \$0 | \$0 | \$0 | \$447,200 | \$447,200 |
| Incentive Payments | 1350 | \$0 | \$0 | \$0 | \$1,979,408 | \$1,979,408 |
| Other Contract Amtrak | 1360 | \$0 | \$0 | \$0 | \$2,575,529 | \$2,575,529 |
| Recollectible Recoveries | 1370 | \$0 | \$0 | \$0 | (\$2,115,278) | (\$2,115,278) |
| Gilroy Trackage | 1380 | \$0 | \$0 | \$447,000 | \$0 | \$447,000 |
| G&A/Support | 1390 | \$5,433,383 | \$0 | \$507,435 | \$1,042,062 | \$6,982,880 |
| Total Cost = | | \$30,842,208 | \$6,918,096 | \$1,737,016 | \$21,132,784 | \$60,630,104 |

Costs estimated in 1995 dollars.

Prepared by Manuel Padron & Associates

12-Sep-96

CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION PROJECT
APPENDIX 2-1. TRANSBAY TERMINAL EXTENSION/DUAL MODE/60 TRAINS

SUMMARY OF COSTS BY DEPARTMENT AND COST TYPE

| DEPARTMENT | | LABOR | MATL | SERV | OTHER | TOTAL COST |
|---------------------------------|------|---------------------|--------------------|--------------------|---------------------|---------------------|
| <u>Amtrak Costs</u> | | | | | | |
| General & Administrative | 100 | \$509,051 | \$0 | \$0 | \$755,642 | \$1,264,693 |
| Maintenance of Way | 200 | \$2,325,021 | \$670,255 | \$178,811 | \$760,237 | \$3,934,325 |
| Maintenance of Equipment | 300 | \$6,175,231 | \$1,843,379 | \$347,730 | \$247,739 | \$8,614,079 |
| Train and Yard Operations | 400 | \$8,818,255 | \$0 | \$0 | \$81,924 | \$8,900,179 |
| Train and Yard Movement Control | 500 | \$905,038 | \$0 | \$0 | \$51,490 | \$956,528 |
| Revenue Collection | 600 | \$1,121,905 | \$0 | \$270,340 | \$86,625 | \$1,478,870 |
| Revenue Accounting | 700 | \$405,996 | \$0 | \$0 | \$47,642 | \$453,638 |
| Budgets | 800 | \$128,832 | \$0 | \$0 | \$14,800 | \$143,632 |
| Materials Control | 900 | \$209,999 | \$0 | \$0 | \$62,702 | \$272,701 |
| Police | 1000 | \$771,095 | \$0 | \$0 | \$110,755 | \$881,850 |
| Amtrak General Overhead | 1100 | \$0 | \$0 | \$0 | \$1,533,328 | \$1,533,328 |
| Amtrak Management Fee | 1200 | \$0 | \$0 | \$0 | \$1,620,728 | \$1,620,728 |
| <u>JPB Costs</u> | | | | | | |
| Insurance | 1300 | \$0 | \$0 | \$0 | \$5,659,430 | \$5,659,430 |
| Fuel | 1310 | \$0 | \$3,097,696 | \$0 | \$0 | \$3,097,696 |
| Electric Power | 1311 | \$0 | \$256,421 | \$0 | \$0 | \$256,421 |
| Shuttles | 1320 | \$0 | \$0 | \$0 | \$6,034,746 | \$6,034,746 |
| Timetables & Tickets | 1330 | \$0 | \$696,228 | \$0 | \$0 | \$696,228 |
| Utilities | 1340 | \$0 | \$0 | \$0 | \$453,776 | \$453,776 |
| Incentive Payments | 1350 | \$0 | \$0 | \$0 | \$2,476,358 | \$2,476,358 |
| Other Contract Amtrak | 1360 | \$0 | \$0 | \$0 | \$2,174,322 | \$2,174,322 |
| Recollectible Recoveries | 1370 | \$0 | \$0 | \$0 | (\$1,785,767) | (\$1,785,767) |
| Gilroy Trackage | 1380 | \$0 | \$0 | \$447,000 | \$0 | \$447,000 |
| G&A/Support | 1390 | \$4,586,990 | \$0 | \$636,667 | \$879,733 | \$6,103,390 |
| Total Cost = | | \$25,957,414 | \$6,563,978 | \$1,880,548 | \$21,266,209 | \$55,668,149 |

Costs estimated in 1995 dollars.

Prepared by Manuel Padron & Associates

12-Sep-96

CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION PROJECT
APPENDIX 2-2. TRANSBAY TERMINAL EXTENSION/DUAL MODE/86 TRAINS

SUMMARY OF COSTS BY DEPARTMENT AND COST TYPE

| DEPARTMENT | | LABOR | MATL | SERV | OTHER | TOTAL COST |
|---------------------------------|------|---------------------|--------------------|--------------------|---------------------|---------------------|
| <u>Amtrak Costs</u> | | | | | | |
| General & Administrative | 100 | \$727,216 | \$0 | \$0 | \$970,010 | \$1,697,226 |
| Maintenance of Way | 200 | \$2,325,021 | \$670,255 | \$178,811 | \$760,237 | \$3,934,325 |
| Maintenance of Equipment | 300 | \$8,318,328 | \$2,270,097 | \$363,284 | \$328,254 | \$11,279,962 |
| Train and Yard Operations | 400 | \$12,212,728 | \$0 | \$0 | \$113,133 | \$12,325,861 |
| Train and Yard Movement Control | 500 | \$1,292,911 | \$0 | \$0 | \$73,557 | \$1,366,469 |
| Revenue Collection | 600 | \$1,121,905 | \$0 | \$270,340 | \$86,625 | \$1,478,870 |
| Revenue Accounting | 700 | \$405,996 | \$0 | \$0 | \$47,642 | \$453,638 |
| Budgets | 800 | \$193,248 | \$0 | \$0 | \$22,200 | \$215,448 |
| Materials Control | 900 | \$209,999 | \$0 | \$0 | \$62,702 | \$272,701 |
| Police | 1000 | \$1,092,385 | \$0 | \$0 | \$156,903 | \$1,249,288 |
| Amtrak General Overhead | 1100 | \$0 | \$0 | \$0 | \$1,953,606 | \$1,953,606 |
| Amtrak Management Fee | 1200 | \$0 | \$0 | \$0 | \$2,064,961 | \$2,064,961 |
| <u>JPB Costs</u> | | | | | | |
| Insurance | 1300 | \$0 | \$0 | \$0 | \$6,720,159 | \$6,720,159 |
| Fuel | 1310 | \$0 | \$4,333,041 | \$0 | \$0 | \$4,333,041 |
| Electric Power | 1311 | \$0 | \$338,307 | \$0 | \$0 | \$338,307 |
| Shuttles | 1320 | \$0 | \$0 | \$0 | \$6,490,970 | \$6,490,970 |
| Timetables & Tickets | 1330 | \$0 | \$748,862 | \$0 | \$0 | \$748,862 |
| Utilities | 1340 | \$0 | \$0 | \$0 | \$453,776 | \$453,776 |
| Incentive Payments | 1350 | \$0 | \$0 | \$0 | \$2,663,569 | \$2,663,569 |
| Other Contract Amtrak | 1360 | \$0 | \$0 | \$0 | \$2,770,293 | \$2,770,293 |
| Recollectible Recoveries | 1370 | \$0 | \$0 | \$0 | (\$2,275,237) | (\$2,275,237) |
| Gilroy Trackage | 1380 | \$0 | \$0 | \$447,000 | \$0 | \$447,000 |
| G&A/Support | 1390 | \$5,844,261 | \$0 | \$654,665 | \$1,120,864 | \$7,619,790 |
| Total Cost = | | \$33,743,998 | \$8,360,562 | \$1,914,099 | \$24,584,223 | \$68,602,882 |

Costs estimated in 1995 dollars.

Prepared by Manuel Padron & Associates

12-Sep-96

CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION PROJECT
APPENDIX 3-1. TRANSBAY TERMINAL EXTENSION/ELECTRIC POWERPACK/60 TRAINS

SUMMARY OF COSTS BY DEPARTMENT AND COST TYPE

| DEPARTMENT | | LABOR | MATL | SERV | OTHER | TOTAL COST |
|---------------------------------|------|---------------------|--------------------|--------------------|---------------------|---------------------|
| <u>Amtrak Costs</u> | | | | | | |
| General & Administrative | 100 | \$509,051 | \$0 | \$0 | \$789,874 | \$1,298,925 |
| Maintenance of Way | 200 | \$2,325,021 | \$670,255 | \$178,811 | \$760,237 | \$3,934,325 |
| Maintenance of Equipment | 300 | \$7,038,149 | \$2,116,579 | \$347,730 | \$280,770 | \$9,783,229 |
| Train and Yard Operations | 400 | \$8,818,255 | \$0 | \$0 | \$81,924 | \$8,900,179 |
| Train and Yard Movement Control | 500 | \$905,038 | \$0 | \$0 | \$51,490 | \$956,528 |
| Revenue Collection | 600 | \$1,121,905 | \$0 | \$270,340 | \$86,625 | \$1,478,870 |
| Revenue Accounting | 700 | \$405,996 | \$0 | \$0 | \$47,642 | \$453,638 |
| Budgets | 800 | \$128,832 | \$0 | \$0 | \$14,800 | \$143,632 |
| Materials Control | 900 | \$209,999 | \$0 | \$0 | \$62,702 | \$272,701 |
| Police | 1000 | \$771,095 | \$0 | \$0 | \$110,755 | \$881,850 |
| Amtrak General Overhead | 1100 | \$0 | \$0 | \$0 | \$1,601,921 | \$1,601,921 |
| Amtrak Management Fee | 1200 | \$0 | \$0 | \$0 | \$1,693,230 | \$1,693,230 |
| <u>JPB Costs</u> | | | | | | |
| Insurance | 1300 | \$0 | \$0 | \$0 | \$5,659,430 | \$5,659,430 |
| Fuel | 1310 | \$0 | \$3,407,465 | \$0 | \$0 | \$3,407,465 |
| Electric Power | 1311 | \$0 | \$256,421 | \$0 | \$0 | \$256,421 |
| Shuttles | 1320 | \$0 | \$0 | \$0 | \$6,034,746 | \$6,034,746 |
| Timetables & Tickets | 1330 | \$0 | \$696,228 | \$0 | \$0 | \$696,228 |
| Utilities | 1340 | \$0 | \$0 | \$0 | \$453,776 | \$453,776 |
| Incentive Payments | 1350 | \$0 | \$0 | \$0 | \$2,476,358 | \$2,476,358 |
| Other Contract Amtrak | 1360 | \$0 | \$0 | \$0 | \$2,271,589 | \$2,271,589 |
| Recollectible Recoveries | 1370 | \$0 | \$0 | \$0 | (\$1,865,653) | (\$1,865,653) |
| Gilroy Trackage | 1380 | \$0 | \$0 | \$447,000 | \$0 | \$447,000 |
| G&A/Support | 1390 | \$4,792,187 | \$0 | \$636,667 | \$919,088 | \$6,347,942 |
| Total Cost = | | \$27,025,529 | \$7,146,948 | \$1,880,548 | \$21,531,305 | \$57,584,329 |

Costs estimated in 1995 dollars.

Prepared by Manuel Padron & Associates

12-Sep-96

CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION PROJECT
APPENDIX 3-2. TRANSBAY TERMINAL EXTENSION/ELECTRIC POWERPACK/86 TRAINS

SUMMARY OF COSTS BY DEPARTMENT AND COST TYPE

| DEPARTMENT | | LABOR | MATL | SERV | OTHER | TOTAL COST |
|---------------------------------|------|--------------|-------------|-------------|---------------|---------------|
| <u>Amtrak Costs</u> | | | | | | |
| General & Administrative | 100 | \$727,216 | \$0 | \$0 | \$1,012,506 | \$1,739,722 |
| Maintenance of Way | 200 | \$2,325,021 | \$670,255 | \$178,811 | \$760,237 | \$3,934,325 |
| Maintenance of Equipment | 300 | \$9,353,595 | \$2,616,003 | \$363,284 | \$369,543 | \$12,702,425 |
| Train and Yard Operations | 400 | \$12,212,728 | \$0 | \$0 | \$113,133 | \$12,325,861 |
| Train and Yard Movement Control | 500 | \$1,292,911 | \$0 | \$0 | \$73,557 | \$1,366,469 |
| Revenue Collection | 600 | \$1,121,905 | \$0 | \$270,340 | \$86,625 | \$1,478,870 |
| Revenue Accounting | 700 | \$405,996 | \$0 | \$0 | \$47,642 | \$453,638 |
| Budgets | 800 | \$193,248 | \$0 | \$0 | \$22,200 | \$215,448 |
| Materials Control | 900 | \$209,999 | \$0 | \$0 | \$62,702 | \$272,701 |
| Police | 1000 | \$1,092,385 | \$0 | \$0 | \$156,903 | \$1,249,288 |
| Amtrak General Overhead | 1100 | \$0 | \$0 | \$0 | \$2,037,109 | \$2,037,109 |
| Amtrak Management Fee | 1200 | \$0 | \$0 | \$0 | \$2,153,224 | \$2,153,224 |
| <u>JPB Costs</u> | | | | | | |
| Insurance | 1300 | \$0 | \$0 | \$0 | \$6,720,159 | \$6,720,159 |
| Fuel | 1310 | \$0 | \$4,766,345 | \$0 | \$0 | \$4,766,345 |
| Electric Power | 1311 | \$0 | \$338,307 | \$0 | \$0 | \$338,307 |
| Shuttles | 1320 | \$0 | \$0 | \$0 | \$6,490,970 | \$6,490,970 |
| Timetables & Tickets | 1330 | \$0 | \$748,862 | \$0 | \$0 | \$748,862 |
| Utilities | 1340 | \$0 | \$0 | \$0 | \$453,776 | \$453,776 |
| Incentive Payments | 1350 | \$0 | \$0 | \$0 | \$2,663,569 | \$2,663,569 |
| Other Contract Amtrak | 1360 | \$0 | \$0 | \$0 | \$2,888,703 | \$2,888,703 |
| Recollectible Recoveries | 1370 | \$0 | \$0 | \$0 | (\$2,372,487) | (\$2,372,487) |
| Gilroy Trackage | 1380 | \$0 | \$0 | \$447,000 | \$0 | \$447,000 |
| G&A/Support | 1390 | \$6,094,061 | \$0 | \$654,665 | \$1,168,773 | \$7,917,499 |
| Total Cost = | | \$35,029,066 | \$9,139,772 | \$1,914,099 | \$24,908,844 | \$70,991,781 |

Costs estimated in 1995 dollars.

Prepared by Manuel Padron & Associates

12-Sep-96

CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION PROJECT
APPENDIX 4-1. TRANSBAY TERMINAL EXTENSION/ELECTRIC MODE/60 TRAINS

SUMMARY OF COSTS BY DEPARTMENT AND COST TYPE

| DEPARTMENT | | LABOR | MATL | SERV | OTHER | TOTAL COST |
|---------------------------------|------|---------------------|--------------------|--------------------|---------------------|---------------------|
| <u>Amtrak Costs</u> | | | | | | |
| General & Administrative | 100 | \$509,051 | \$0 | \$0 | \$763,885 | \$1,272,936 |
| Maintenance of Way | 200 | \$2,741,998 | \$1,374,318 | \$178,811 | \$786,034 | \$5,081,161 |
| Maintenance of Equipment | 300 | \$5,194,776 | \$1,404,550 | \$347,730 | \$239,927 | \$7,186,983 |
| Train and Yard Operations | 400 | \$8,818,255 | \$0 | \$0 | \$81,924 | \$8,900,179 |
| Train and Yard Movement Control | 500 | \$905,038 | \$0 | \$0 | \$51,490 | \$956,528 |
| Revenue Collection | 600 | \$1,121,905 | \$0 | \$270,340 | \$86,625 | \$1,478,870 |
| Revenue Accounting | 700 | \$405,996 | \$0 | \$0 | \$47,642 | \$453,638 |
| Budgets | 800 | \$128,832 | \$0 | \$0 | \$14,800 | \$143,632 |
| Materials Control | 900 | \$209,999 | \$0 | \$0 | \$62,702 | \$272,701 |
| Police | 1000 | \$771,095 | \$0 | \$0 | \$110,755 | \$881,850 |
| Amtrak General Overhead | 1100 | \$0 | \$0 | \$0 | \$1,517,823 | \$1,517,823 |
| Amtrak Management Fee | 1200 | \$0 | \$0 | \$0 | \$1,604,339 | \$1,604,339 |
| <u>JPB Costs</u> | | | | | | |
| Insurance | 1300 | \$0 | \$0 | \$0 | \$5,659,430 | \$5,659,430 |
| Fuel | 1310 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Electric Power | 1311 | \$0 | \$3,458,214 | \$0 | \$0 | \$3,458,214 |
| Shuttles | 1320 | \$0 | \$0 | \$0 | \$6,034,746 | \$6,034,746 |
| Timetables & Tickets | 1330 | \$0 | \$696,228 | \$0 | \$0 | \$696,228 |
| Utilities | 1340 | \$0 | \$0 | \$0 | \$453,776 | \$453,776 |
| Incentive Payments | 1350 | \$0 | \$0 | \$0 | \$2,476,358 | \$2,476,358 |
| Other Contract Amtrak | 1360 | \$0 | \$0 | \$0 | \$2,230,107 | \$2,230,107 |
| Recollectible Recoveries | 1370 | \$0 | \$0 | \$0 | (\$1,831,583) | (\$1,831,583) |
| Gilroy Trackage | 1380 | \$0 | \$0 | \$447,000 | \$0 | \$447,000 |
| G&A/Support | 1390 | \$4,704,675 | \$0 | \$636,667 | \$902,304 | \$6,243,645 |
| Total Cost = | | \$25,511,620 | \$6,933,309 | \$1,880,548 | \$21,293,083 | \$55,618,560 |

Costs estimated in 1995 dollars.

Prepared by Manuel Padron & Associates

12-Sep-96

CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION PROJECT
APPENDIX 4-2. TRANSBAY TERMINAL EXTENSION/ELECTRIC MODE/86 TRAINS

SUMMARY OF COSTS BY DEPARTMENT AND COST TYPE

| DEPARTMENT | | LABOR | MATL | SERV | OTHER | TOTAL COST |
|---------------------------------|------|--------------|-------------|-------------|---------------|---------------|
| <u>Amtrak Costs</u> | | | | | | |
| General & Administrative | 100 | \$727,216 | \$0 | \$0 | \$964,738 | \$1,691,953 |
| Maintenance of Way | 200 | \$2,741,998 | \$1,374,318 | \$178,811 | \$786,034 | \$5,081,161 |
| Maintenance of Equipment | 300 | \$6,808,189 | \$1,715,777 | \$363,284 | \$309,506 | \$9,196,756 |
| Train and Yard Operations | 400 | \$12,212,728 | \$0 | \$0 | \$113,133 | \$12,325,861 |
| Train and Yard Movement Control | 500 | \$1,292,911 | \$0 | \$0 | \$73,557 | \$1,366,469 |
| Revenue Collection | 600 | \$1,121,905 | \$0 | \$270,340 | \$86,625 | \$1,478,870 |
| Revenue Accounting | 700 | \$405,996 | \$0 | \$0 | \$47,642 | \$453,638 |
| Budgets | 800 | \$193,248 | \$0 | \$0 | \$22,200 | \$215,448 |
| Materials Control | 900 | \$209,999 | \$0 | \$0 | \$62,702 | \$272,701 |
| Police | 1000 | \$1,092,385 | \$0 | \$0 | \$156,903 | \$1,249,288 |
| Amtrak General Overhead | 1100 | \$0 | \$0 | \$0 | \$1,899,932 | \$1,899,932 |
| Amtrak Management Fee | 1200 | \$0 | \$0 | \$0 | \$2,008,228 | \$2,008,228 |
| <u>JPB Costs</u> | | | | | | |
| Insurance | 1300 | \$0 | \$0 | \$0 | \$6,720,159 | \$6,720,159 |
| Fuel | 1310 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Electric Power | 1311 | \$0 | \$4,754,966 | \$0 | \$0 | \$4,754,966 |
| Shuttles | 1320 | \$0 | \$0 | \$0 | \$6,490,970 | \$6,490,970 |
| Timetables & Tickets | 1330 | \$0 | \$748,862 | \$0 | \$0 | \$748,862 |
| Utilities | 1340 | \$0 | \$0 | \$0 | \$453,776 | \$453,776 |
| Incentive Payments | 1350 | \$0 | \$0 | \$0 | \$2,663,569 | \$2,663,569 |
| Other Contract Amtrak | 1360 | \$0 | \$0 | \$0 | \$2,791,531 | \$2,791,531 |
| Recollectible Recoveries | 1370 | \$0 | \$0 | \$0 | (\$2,292,680) | (\$2,292,680) |
| Gilroy Trackage | 1380 | \$0 | \$0 | \$447,000 | \$0 | \$447,000 |
| G&A/Support | 1390 | \$5,889,067 | \$0 | \$654,665 | \$1,129,457 | \$7,673,189 |
| Total Cost = | | \$32,695,642 | \$8,593,922 | \$1,914,099 | \$24,487,983 | \$67,691,647 |

Costs estimated in 1995 dollars.

Prepared by Manuel Padron & Associates

12-Sep-96

